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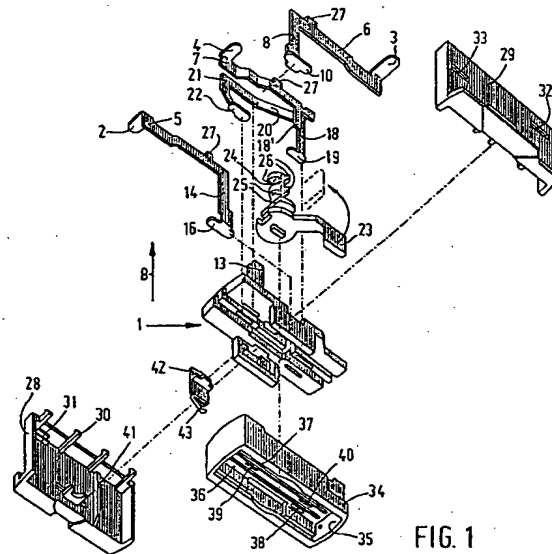
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NL-5600 AP Eindhoven (NL)(54) **An adapter.**

(57) The invention relates to an adapter provided with a housing, which is intended for being connected to a mounting rail, which is provided with conductor rails extending in the longitudinal direction of the mounting rail, with which contact tongues of the adapter co-operate. The contact tongues are provided on the ends of strip-shaped contact arms, which extend in the longitudinal direction of the housing. The strip-shaped contact arms can be pivoted transversely to their longitudinal direction by means of a setting means, which is rotatably journaled in the housing. The ends of the strip-shaped contact arms remote from the contact tongues are connected to strip-shaped connecting arms, which extend transversely to the contact arms and which, with their ends remote from the contact arms, are connected to the housing of the adapter.



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The invention relates to an adapter provided with a housing, which is intended for being connected to a mounting rail, which has a recess extending in the longitudinal direction of the mounting rail, said recess containing a plurality of conductor rails extending therein, with which contact tongues of the adapter co-operate, whereby said contact tongues are provided on the ends of strip-shaped contact arms, which extend in the longitudinal direction of the housing, at least substantially parallel to the conductor rails in the operating position of the adapter, with the longitudinal sides of their at least substantially rectangular sections extending at least substantially parallel to the direction of insertion of the adapter in the recess in the rail, and which co-operate with a setting means pivotally arranged in the housing, by means of which said strip-shaped contact arms can be pivoted transversely to their longitudinal direction so as to move the contact tongues into or out of contact with the conductor rails.

Such an adapter is for example known from British Patent No. 2,140,983. With this known construction the ends of the strip-shaped contact arms remote from the contact tongues are connected to the housing of the adapter by attachment screws. The vertical position of the contact tongues in the direction of insertion of the adapter into the recess in the rail is exactly fixed, therefore. In practice it has become apparent that with different makes of conductor rails small variations may occur in the vertical position of the conductor rails. As a consequence of this it is generally not possible for an adapter intended for connection to a certain mounting rail to be used for connection to another mounting rails. This limits the application possibilities of elements equipped with adapter, such as for example light spots or the like, which are to be connected to the conductor rails.

The object of the invention is therefore to obtain an adapter of the above kind, which is constructed in such a manner that the adapter can be connected to different mounting rails in which the vertical position of the conductor rails relative to each other, seen in the direction of insertion of the adapter into the recess in the mounting rail, may exhibit variations.

According to the invention this may be achieved in that the ends of the strip-shaped contact arms remote from the contact tongues are connected to strip-shaped connecting arms, which extend transversely to the contact arms and which, with their ends remote from the contact arms, are connected to the housing of the adapter, whereby the longitudinal sides of the at least substantially rectangular cross-sections of the connecting arms extend at least substantially parallel to the longitudinal direction of the housing.

When using the construction according to the invention a sturdy construction of the contact arms and the strip-shaped connecting arms supporting said contact arms can be obtained, whilst the contact tongues connected to the free ends of the contact arms are still movable in the intended direction of insertion of the adapter into the recess in the conductor rail to a certain extent, so that the contact tongues can adapt their position to the vertical position of the conductor rails in the mounting rail.

It is noted that British Patent No. 1,591,358 discloses an adapter, which according to the description is constructed in such a manner that also here an adaptation to varying vertical positions of conductor rails in different mounting rails is achieved.

The contacts to be brought into contact with the conductor rails are mounted on the ends of resilient wires, which, insofar as can be inferred from the disclosure of said British Patent No. 1,591,358, extend along the outside of the housing of the adapter in the operating position, and which can be retracted through openings in the housing of the adapter in order to disconnect the adapter from the mounting rail. The disclosure does not indicate how said retracting or extending of the resilient wires must be realised. If indeed a construction of this kind could be realised, such a construction would seem to be highly susceptible to malfunction.

The invention will be explained in more detail hereafter with reference to an embodiment of the construction according to the invention diagrammatically illustrated in the accompanying Figures.

Figure 1 is a diagrammatic perspective view of parts comprising the adapter, illustrated in spaced-apart relationship.

Figure 2 is a larger-scale perspective view of the housing part supporting the contact arms, with the contact arms mounted thereon.

As will be apparent from Figures 1 and 2 the adapter according to the invention comprises a housing part 1 for supporting contact arms 5 - 7 supporting contact tongues 2 - 4. The strip-shaped contact arm 6 of at least substantially rectangular section, which extends in the longitudinal direction of the adapter, is connected, with its end remote from the contact tongue 3 integral therewith, to a strip-shaped connecting arm 8 of rectangular section which is integral with the contact arm 6, said connecting arm 8 extending at least substantially perpendicularly to the contact arm 6.

The end of the connecting arm 8 remote from the contact arm 6 is connected, by means of an intermediate piece 9 which is slightly staggered with respect to the connecting arm 8, to a baseplate 10 integral therewith, said baseplate, as

will be apparent from the Figures, extending perpendicularly to the connecting arm 8 and being supported on a bottom plate 11 of the housing part 1. A retaining bracket 12 of L-shaped section, which joins the bottom plate 11, embraces the baseplate 10. The connecting arm 8 is slidably accommodated between the legs of a guide 13 of U-shaped section forming part of the housing 1, said legs extending parallel to the connecting arm.

In a similar manner as described above a connecting arm 14 is connected to the end of the contact arm 5 remote from the contact tongue 2, which connecting arm is slidably retained between the legs of a guide 15 of U-shaped section forming part of the housing part 1, said legs extending parallel to the connecting arm. As is apparent from Figure 1 a baseplate 16 similar to the baseplate 10 is mounted on the end of the connecting arm 14 remote from the contact arm 5, said baseplate 16 being connected to the bottom plate 11 of the housing part 1 in a similar manner as described above with regard to the baseplate 10.

The contact arm 7 is slightly gabled and is connected, at its end remote from the contact tongue 4, to a strip-shaped connecting arm 18 by means of a connecting part 17 extending parallel to the contact tongue 4, said connecting arm 18 extending perpendicularly to the contact arm 7. A baseplate 19 corresponding with the baseplates 10 and 16 is attached to the end of the connecting arm 18 remote from the connecting part 17.

One end of a gabled coupling arm 20 is connected to the end of the connecting arm 18 remote from the baseplate 19, the end of said coupling arm 20 remote from the connecting part 17 being located near the U-shaped guide means 13. An arm 21, which extends parallel to the connecting arm 18, is connected to said end. A baseplate 22 similar to the baseplates 10, 16 and 19, which is supported on the bottom plate 11, is provided at the end of the connecting arm 21 remote from the coupling arm 20.

The contact arm 7 is integral with an arm piece 18' connected to said contact arm 7, which extends parallel to the connecting arm 18, said arm piece being slidably accommodated in a guide 13' corresponding with the guides 13 and 15.

The housing part 1 furthermore supports a roller 24 comprising a setting means, said roller being rotatable about an axis of rotation by means of a lever 23. Locking fingers 25 are secured to said roller, by means of which the adapter can be locked to a mounting rail. Furthermore projecting cams 26 are mounted on the roller 24 for co-operation with cam-shaped projections 27 secured to the contact arms 5 - 7 in such a manner, that by rotating the roller 24 the contact tongues 2 - 4 are movable in the direction according to the arrow A

(Figure 2) by deflection of the contact arms, in order to bring the contact tongues into contact with conductors rails provided in a mounting rail or to move the contact tongues in a direction remote from said conductors rails, as the case may be.

This is a common and well-known construction for such adapter, which therefore need not be discussed in more detail herein.

The contact arms, connecting arms and the like located above the bottom plate 11 in Figure 2 can be screened off by means of two housing parts 28 and 29 illustrated in Figure 1, which may be disposed on either side of the parts mounted on top of the bottom plate 1 in Figure 2 and be attached together and to the housing part by a snap fit, inter alia utilizing locking fingers 30 integral with the housing part 28, which engage behind cams provided in the housing part 29.

In the side wall of the housing part 28 a slotted opening 31 is provided for the passage of the contact tongue 2. Two slotted openings 32 and 33 are similarly provided in the housing part 29 for the passage of the contact tongues 3 and 4.

A housing part 34 may be snap-mounted on the bottom side of the housing part 1, said housing part 34 at its bottom side being provided with a recess 35 for receiving a connecting part of an apparatus to be coupled to the adapter, such as a spotlight or the like.

The recess 35 is at its upper side bounded by an upper wall 36, which abuts against the bottom plate 11 of the housing part 1 in mounted position. In the upper wall 36 a slotted hole 37 is provided, which in mounted position is located opposite a similar slotted hole in the bottom plate 11 near the baseplate 10. A slotted hole 38 provided in the upper wall 36 is located near a similar slotted hole in the bottom plate 11 near the baseplate 16 in mounted condition. Further slotted holes 39 and 40 are located opposite similar slotted holes provided in the bottom plate 11 near the baseplates 22 and 19.

As is furthermore shown for the housing cover 28, said housing cover 28 has at its inner side an inwardly projecting rib 41. When the housing cover 28 is mounted on the housing part 1, said rib 41 will extend at least substantially parallel to and to the right of the strip-shaped connecting arm 14, when seen in Figure 2, so that the rib 41 retains the strip-shaped connecting arm 14 between the legs of the guide means 15 of U-shaped section.

Similar ribs will be provided on the housing cover 29, so as to retain in a similar manner the connecting arm 8 and the arm piece 18' within the guide means 13 and 13' respectively of U-shaped section.

In order to connect the adapter to a mounting rail the part of the adapter comprising the housing

parts 28 and 29 will be inserted into the recess of the mounting rail generally having a U-shaped section in the direction according to the arrow B. The lock 42 forming part of the adapter will thereby be moved, against the action of a spring 43 connected thereto, into a position in which the lock releases the blocking of the roller 24 against rotation. Upon rotation of the roller 24 the contact tongues 2 and 3, when moving towards the outside through the slots 31 and 32 as a result of pivoting of the contact arms 5 and 6 effected by means of the roller 24, will be brought into engagement with conductors rails of the mounting rail. The contact tongue 4 will move towards the outside through the slot 33 and be brought into contact with a zero rail or zero conductor.

In practice it has become apparent that owing to the above-described embodiment, in spite of the sturdy support of the contact tongues by means of the strip-shaped contact arms and the strip-shaped connecting arms integral therewith, the contact tongues can still deflect perpendicularly to their intended direction of movement according to the arrow A to a certain extent, as a result of a certain amount of resilient deformation of the respective contact fingers and contact arms, in particular at their connection, near the supports 10, 16, 19 positioned on the bottom plate, whereby the retaining of the respective supports by means of the retaining brackets 12 may also be designed such, that there is a certain amount of play, which also assists in enabling the contact tongues to perform a movement in a direction perpendicularly to the direction of movement according to the arrow A. As a consequence an adaptation of the vertical position of the contact tongues 2 - 4 to varying vertical positions of the conductor rails within the mounting rails can still be realised, in spite of the sturdy construction of the contact tongues and the parts supporting said contact tongues.

By connecting the contact tongue 4 coming into contact with the zero conductor to a pair of supports 19 and 22, which are disposed symmetrically relative to each other, connection with the zero conductor will be effected at all times, independent of the manner in which a connecting piece fitting the recess 35 of the adapter is inserted.

Claims

1. An adapter provided with a housing, which is intended for being connected to a mounting rail, which has a recess extending in the longitudinal direction of the mounting rail, said recess containing a plurality of conductor rails extending therein, with which contact tongues of the adapter co-operate, whereby said con-

tact tongues are provided on the ends of strip-shaped contact arms, which extend in the longitudinal direction of the housing, at least substantially parallel to the conductor rails in the operating position of the adapter, with the longitudinal sides of their at least substantially rectangular sections extending at least substantially parallel to the direction of insertion of the adapter in the recess in the rail, and which cooperate with a setting means pivotally arranged in the housing, by means of which said strip-shaped contact arms can be pivoted transversely to their longitudinal direction so as to move the contact tongues into or out of contact with the conductor rails, characterized in that the ends of the strip-shaped contact arms remote from the contact tongues are connected to strip-shaped connecting arms, which extend transversely to the contact arms and which, with their ends remote from the contact arms, are connected to the housing of the adapter, whereby the longitudinal sides of the at least substantially rectangular cross-sections of the connecting arms extend at least substantially parallel to the longitudinal direction of the housing.

2. An adapter according to claim 1, characterized in that one connecting arm is slidably retained between guide ribs forming part of the housing.
3. An adapter according to claim 2, characterized in that said guide ribs form part of a guide means of U-shaped section, whilst a housing part is provided with a rib, which limits the movement of the connecting arm transversely to its longitudinal direction.
4. An adapter according to any one of the preceding claims, characterized in that the end of the connecting arm remote from the contact arm is provided with a baseplate, which is connected to a bottom plate of the housing.
5. An adapter according to claim 4, characterized in that the baseplate is connected to the bottom plate of the housing by means of a retaining bracket secured to the bottom plate, which embraces said baseplate.
6. An adapter according to any one of the preceding claims, characterized in that contact arms extending in opposite directions from the contact tongues are connected to the contact tongues to be connected to charged conductor rails, each of said contact arms at their ends remote from the contact tongues being con-

nected to connecting arms.

7. An adapter according to any one of the preceding claims, characterized in that a contact tongue to be brought into contact with a non-charged conductor rail or zero conductor is connected, by means of a contact arm extending at least substantially in the longitudinal direction of the housing, whilst near the connection point of the contact arm a coupling arm, extending at least substantially parallel to the contact arm, is connected to said connecting arm, said coupling arm at its end located near the contact tongue in question being connected to a further connecting arm, whilst these two interconnected connecting arms are each provided with a baseplate being supported on the bottom plate of the housing, in such a manner that said baseplates are disposed symmetrically with respect to a recess in the housing at the side of the housing remote from the part of the housing which is intended for being inserted into the mounting rail.

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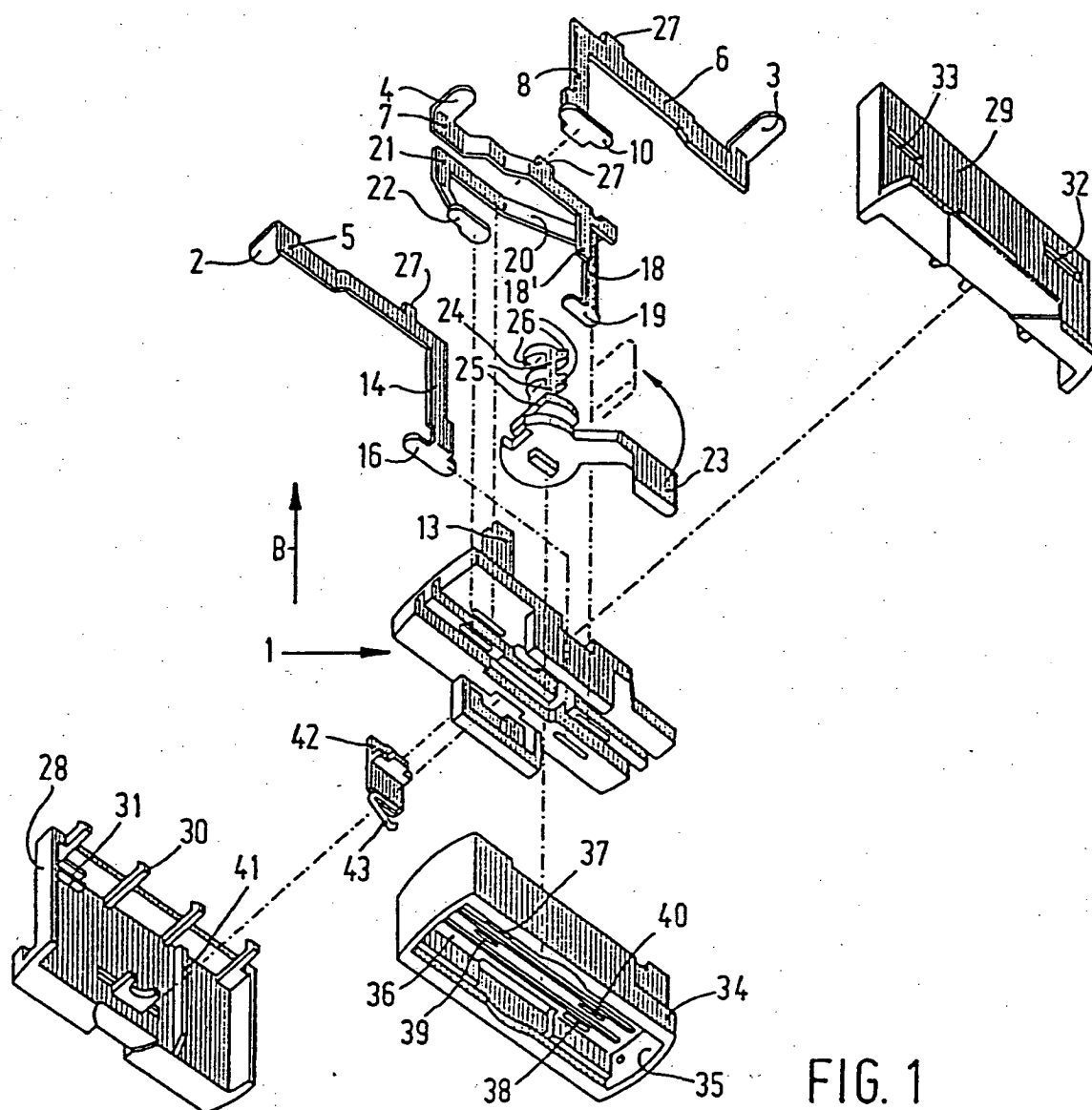
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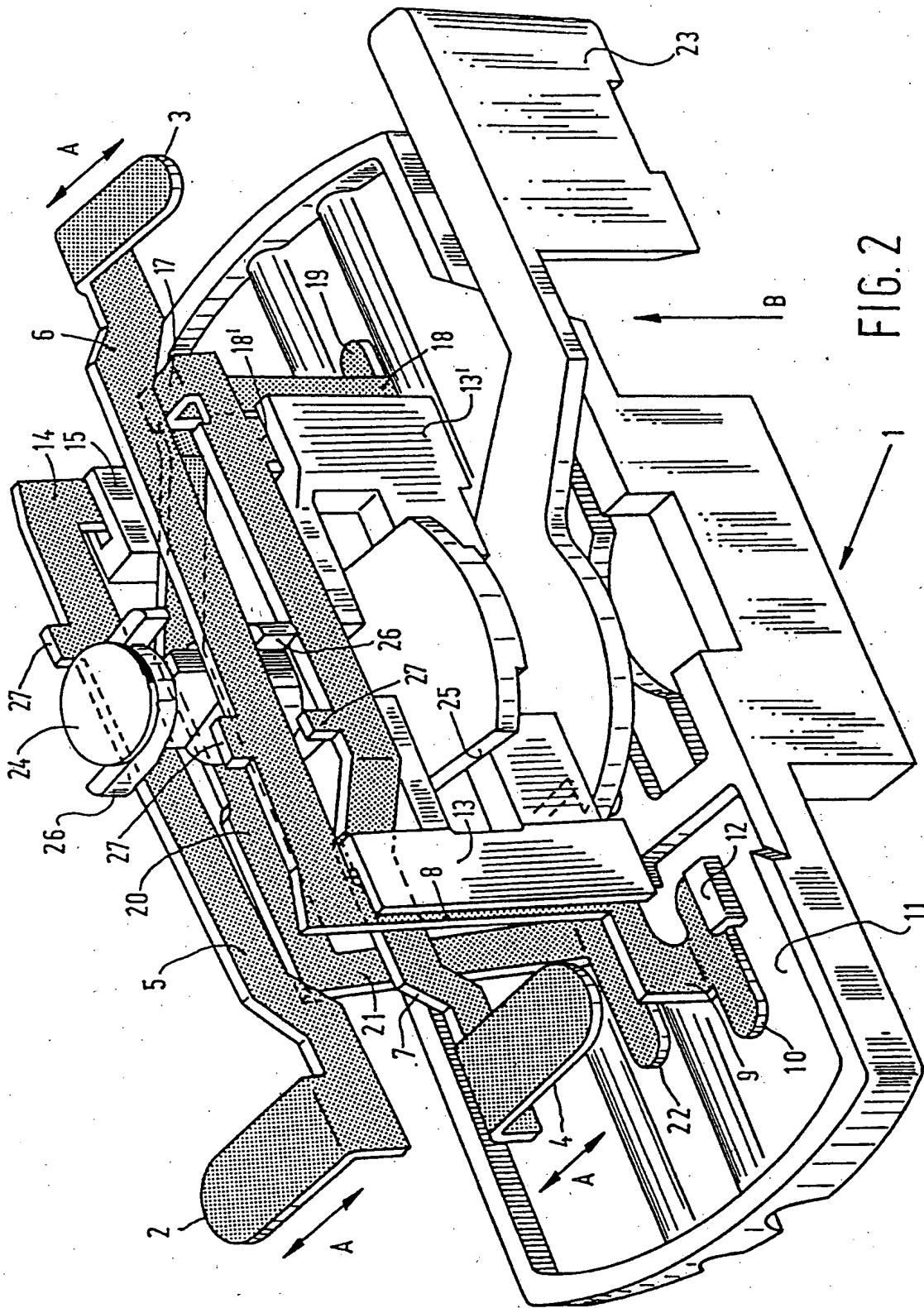
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EUROPEAN SEARCH REPORT

Application Number

EP 93 20 0659

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	DE-A-3 214 911 (ELEKTRA GMBH & CO KG) * page 3 - page 8; figures 1-8 * ---	1	H01R25/14
A	DE-A-3 135 845 (ELEKTRA GMBH & CO KG) * page 3 - page 10; figures 1-9 * ---	1,6	
A	NL-A-8 802 033 (LUMINANCE B.V.) * page 2, line 13 - page 3, line 25; figure 3 * ---	2-5	
A	EP-A-0 344 703 (LTS LICHTTECHNIK) * column 2, line 50 - column 6, line 8; figures 1-8 * ---	1	
D,A	GB-A-2 140 983 (PROFILUX SRL) * abstract; figures 1,5 * -----	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			H01R
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 25 MAY 1993	Examiner TAPPEINER R.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			